REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Official Action dated May 10, 2004 and the phone conversation with the Examiner on August 10, 2004. Applicants will contact the Examiner after filing this response to schedule a phone interview on the dates suggested by the Examiner. In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

Claims 1-4 and 9-30 are under consideration in this application. Claims 5-8 are being cancelled without prejudice or disclaimer. Claim 1 is being amended, as set forth above and in the attached marked-up presentation of the claim amendments, in order to more particularly define and distinctly claim Applicants' invention. New claims 13-30 are being added to recite other embodiments described in the specification.

Additional Amendments

The claims are being amended to correct formal errors and/or to better disclose or describe the features of the present invention as claimed. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

Double Patenting Rejection

Non-statutory, obviousness-type double patenting rejection was maintained against claims 1-8 as being unpatentable over claims 1-3 of the patent issued into U.S Pat. 6,428,749 due to the recitation of "filled with a heat insulating material" is not supported by the specification.

Applicants contend that claim 1 of the application now recites a distinctive limitation of "a cover placed on top of the probe cells for accommodating a sample solution between the cover and the probe cells" that is absent from claim 1 of the '749 patent. Accordingly, the withdrawal of the outstanding double patenting rejection is in order, and is therefore respectfully solicited.

Prior Art Rejections

Claims 1-3 and 5-7 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Pat. No. 6,106,784 to Lund et al. (hereinafter "Lund") and US Pat. No. 6,632,653 to Astle (hereinafter "Astle") respectively. Claim 5 is further rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Pat. No. 6,093,370 to Yasuda et al (hereinafter "Yasuda") as defined by Physics: Principles with Application by Giancoli DC (1991), and Claim 8 is further rejected under 35 U.S.C. § 102(e) as being anticipated by Yasuda as defined by Giancoli and Handbook of Chemistry & Physics. Claims 6-7 and 9-12 remain rejected under 35 U.S.C. § 103(a) as being unpatentable over Yasuda as defined by Giancoli in view of U.S. Pat. No. 6,051,380 Sosnowski et al. (hereinafter "Sosnowski"). Claims 9-12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Astle in view of Sosnowski. These rejections have been carefully considered, but are most respectfully traversed.

The biochemical reaction detection apparatus (e.g. Fig. 2B; page 26, 2nd-3rd paragraphs) of the invention as now recited in claim 5, comprises: a first membrane 22; a plurality of islands 21 provided on one side of said first membrane 22; probe cells for immobilizing probes for detecting biochemical reactions, each of said probe cells being provided on a side opposite to said one side of said first membrane 22 corresponding to one of the islands 21 though a cross section of the first membrane; and a cover 27 placed on top of the probe cells for accommodating a sample solution 26 between the cover 27 and the probe cells (Fig. 2B; "*Sample solution 26 is preferably added in the amount sufficient for making the solution layer with a thickness of 10-100 μm After addition of sample solution 26, a glass cover 27 is placed thereon*" p. 13, last line to p. 14, 1st line; p. 26, last two lines; Example 5: pp. 36-40). The islands are spaced from each other (page 6, line 15) with intervals (claim 5), and each of the islands includes a temperature controller for heating and temperature-controlling a corresponding one of said probe cells independently so that the temperature of the sample solution is controlled independently cell by cell (e.g., page 6, line 17; e.g., Fig. 13; "*evaluating 1 kind of sample DNA using 8-base probes*" p. 39, lines 2-3).

For example, a DNA chip in Fig. 13 having 36 probe cells, comprising 4 kinds of probes (probe 2 through probe 5) immobilized on 9 probe cells per each kind of probes. A sample solution is injected onto this chip for hybridization. The temperature for hybridization is set within the range of 10-50°C for each column at intervals of 5°C for the probe cells arranged forming column a through column i (10°C for column a, 15°C for column b, 20°C for column c, . . . 45°C for column h, 50°C for column i). P. 37, 3rd paragraph.

The invention is also directed to a biochemical reaction detection apparatus, as now recited in claim 18, comprising: a first membrane, a first side thereof being set to be provided with a sample solution; a plurality of islands provided on a second side of said first membrane opposite to the first side of said first membrane; probe cells for immobilizing probes for detecting biochemical reactions, each of said probe cells being provided on the first side of said first membrane corresponding to one of the islands through a cross section of said first membrane, each of said probe cells being set to contact with said sample solution. The islands are spaced from each other with intervals filled with air, and each of the islands includes a temperature controller for heating and temperature-controlling a corresponding one of said probe cells independently so that the temperature of the sample solution is controlled independently cell by cell.

None of the cited prior art references teaches or suggests "each island being provided across a membrane from ONE corresponding probe cell and having a temperature controller for heating and temperature-controlling the corresponding probe cell independently so that the temperature of the sample solution is controlled independently cell by cell".

In contrast, Lund uses a titration plate 19 to ensure the solutions 28 in different probe wells are separated from one another (Figs.2 & 13), rather than having any cover placed on top of the probe cells for accommodating ONE sample solution between the cover and all the probe cells as the invention. It is well established that a rejection based on cited references having principles that teach away from the invention is improper. Lund merely controls the temperature of the respective solution in each probe well, rather than "the temperature of the common sample solution being controlled independently cell by cell".

Astle, not only shares all Lund's deficiencies, but has one addition deficiency, i.e., a plurality of probe cells 32 formed in a thermal transfer station 240 (Fig. 4) such that All the islands/cells 32 therein are heated *together* into only one and only one temperature rather than each probe cell/island being *independently* heated so that the temperature of the sample solution is controlled independently cell by cell.

The other cited prior art references fail to compensate for the above-discussed deficiencies.

Accordingly, Applicants contend that the cited conflicting teachings of the prior art references would not motivate their combination such that their combination would embody each and every feature of the present invention as now claimed in claims 1 and 18, and from which claims 2-4 and 9-30 depend. The difference is more than sufficient that the present invention as now claimed would not have been rendered obvious given the prior art. Rather, the present invention as a whole is

distinguishable, and thereby allowable over the prior art.

Conclusion

In view of all the above, clear and distinct differences as discussed exist between the present invention as now claimed and the prior art reference upon which the rejections in the Office Action rely, Applicants respectfully contend that the prior art references cannot anticipate the present invention or render the present invention obvious. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicants' undersigned representative at the address and phone number indicated below.

Respectfully submitted,

Stanley P. Fisher
Registration Number 24,344

Juan Carlos A. Marquez
Registration Number 34,072

REED SMITH LLP
3110 Fairview Park Drive, Suite 1400
Falls Church, Virginia 22042
(703) 641-4200

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SPF/JCM/JT